Eco**struxure**™
Innovation At Every Level

A single controller for process control and safety

Modicon M580 Safety Ethernet programmable automation controller (ePAC)

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Contents

A pioneering controller with measurable business benefits

Engineered to measurably improve your operational profitability

The Modicon™ M580 Safety Ethernet process automation controller (ePAC) is engineered to measurably increase the operational profitability of your operations safely.

Continuous, open and transparent communication backbone

Complete implementation of Ethernet technology, using ODVA compliant protocols to provide truly open network implementation and the ability to communicate with all compliant devices regardless of their manufacturer.

Securely integrate plant safety functions thanks to dual redundant processor architecture

Built-in safety functionality with dual redundant processor architecture. Eliminates the need to design expensive, separate safety systems.

Complete integration of Ethernet architecture

Smart devices connected to the e-PAC can be transparently accessed though the e-PAC. This means the Apps and Analytics layer to access all the information needed to produce useful business intelligence: Diagnose your complete system from your smartphone, Predictive Maintenance of Power Supply, Dual Power Supplies Management Algorithms, Easy and Scalable Time Stamping System Solutions, Change your operations without stopping your process.

Schneider Electric is committed to providing innovative products, solutions, and services to help you succeed in the more connected, digital world.

Discover EcoStruxure™: Innovation At Every Level

Driving measurable profitability improvements – safely

SAFETY	PROFITABILITY	OPERATIONAL EFFICIENCY	RELIABILITY
Safe — Manage Operating Risk	**-25%** — Reduce Time to Profit	**5X Faster** — Improve Productivity	**-30%** — Improve Reliability & Sustainability
	+10 pts — Increase Revenue (Reduce TCO)		

A pioneering controller   Common safety   High-end capabilities   Seamless integration   Segment applications

How the Modicon M580 Safety ePAC can transform your operations

Reduce Time to Profit

e.g. Reduced design time of control and safety systems can save up to **3 weeks** on a **3 month** project resulting in a **$2 million** of extra **production at launch**

Improve Reliability & Sustainability

Enhanced visibility for improved energy management, safety and control system troubleshooting. Can yield up to $1.8 million/ year in measurable profitability improvements for the average large facility

Improve Productivity

Enhanced control and safety system performance. 5X faster scan time can result in gains of $2 million / year in typical high volume manufacturing plants. Event log helps drive continuous safety improvements

Increase Operational Profitability, Safely

Transparent, open native networks for data driven improvements to plant control and safety systems. Improved visibility can result in over $1.3M in annual bottom-line impact for the typical plant.

Manage Operating Risk

Achilles Level 2 certification which as part of a plant wide cybersecurity plan could reduce the risk of cyber attack saving on average more than $1.25 million/ year in related costs. Faster processor scan time can results in safety system response.

Modicon M580 Safety:

The Modicon M580 Safety Controller is the only PAC in the marketplace that, when applied correctly, offers 100% Measurable* ROI, Safely, within three months of implementation.

*Patent protected

The safety controller with native Ethernet

The Modicon M580 Safety ePAC is the first common safety process automation controller with Ethernet built into its core. This allows you to simplify data exchanges across your enterprise and helps you keep up with the evolving trends in industrial automation.

- **Higher resistance to cybersecurity threats**
  Thanks to the Internet Protocol security (IPsec), encrypted firmware, extended access list, protocol management, and the Achilles Level 2 Security Certification

- **Seamless migration**
  As all Modicon units are managed by a single software – Unity™ Pro

- **Intuitive for future generations**
  Access to all process data from mobile devices

M580 Safety, the ePAC for today and tomorrow

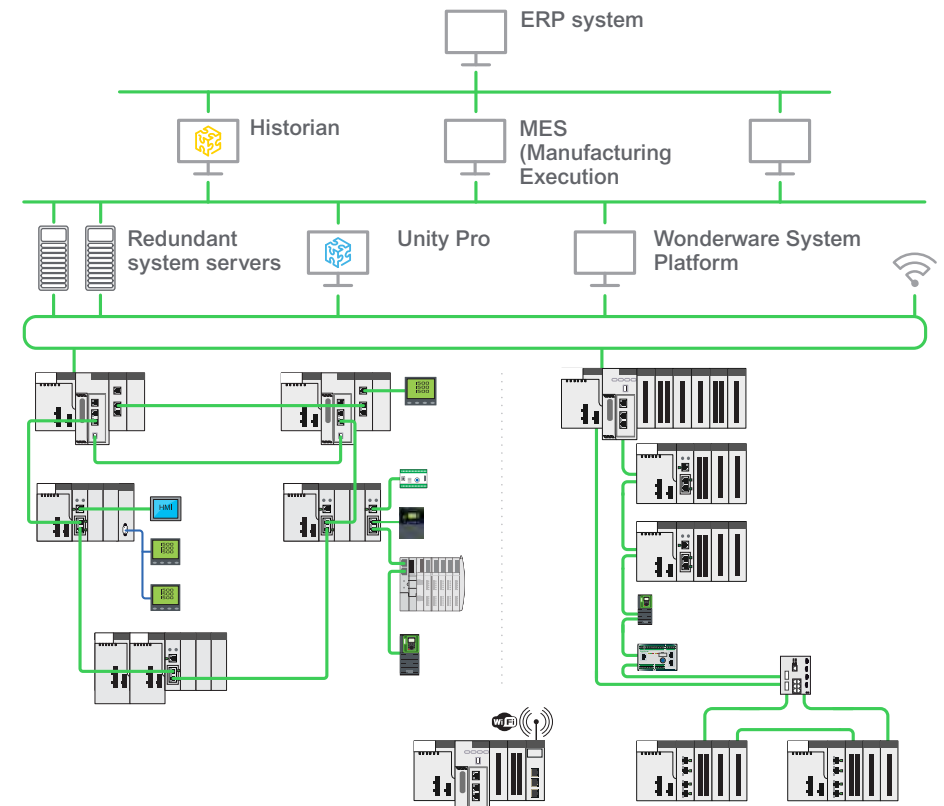**A pioneering controller**   Common safety   High-end capabilities   Seamless integration   Segment applications

Automation solutions with greater transparency, availability, and flexibility

- From field to enterprise level, our automation architectures are based on the standard industrial Ethernet network

- The availability level can be tailored to your application constraints with redundancy for CPUs*, power supplies, I/O as well as for servers, and networks

- For remote applications, extensions are possible via optical fibers between the CPUs or remote racks; additionally, remote diagnostics can be performed via Wi-Fi

- As a common safety controller, the M580 Safety ePAC delivers safety and process control integrated in a single device for reduced complexity and costs and improved operational profitability

* tailoring availability for redundancy for CPUs is a pending capability

ERP system

Historian

MES (Manufacturing Execution

Redundant system servers

Unity Pro

Wonderware System Platform

HMI

A pioneering controller

Common safety

High-end capabilities

Seamless integration

Segment applications

Modicon's proven track record

From a groundbreaking programmable logic controller (PLC) introduced in 1968, Modicon technology has evolved over the last five decades to bring revolutionary results.

Take advantage of our experience

- 50+ years of experience in designing automation solutions

- 30+ years of providing high availability systems with redundancy

- X80 I/O range used by all other Modicon controllers, backed by 10+ years in the field

- 10+ years of continuous improvement in Unity Pro software

Modicon's proven track record

From a groundbreaking PLC to a high-end safety ePAC

50 Years

of innovation and leadership
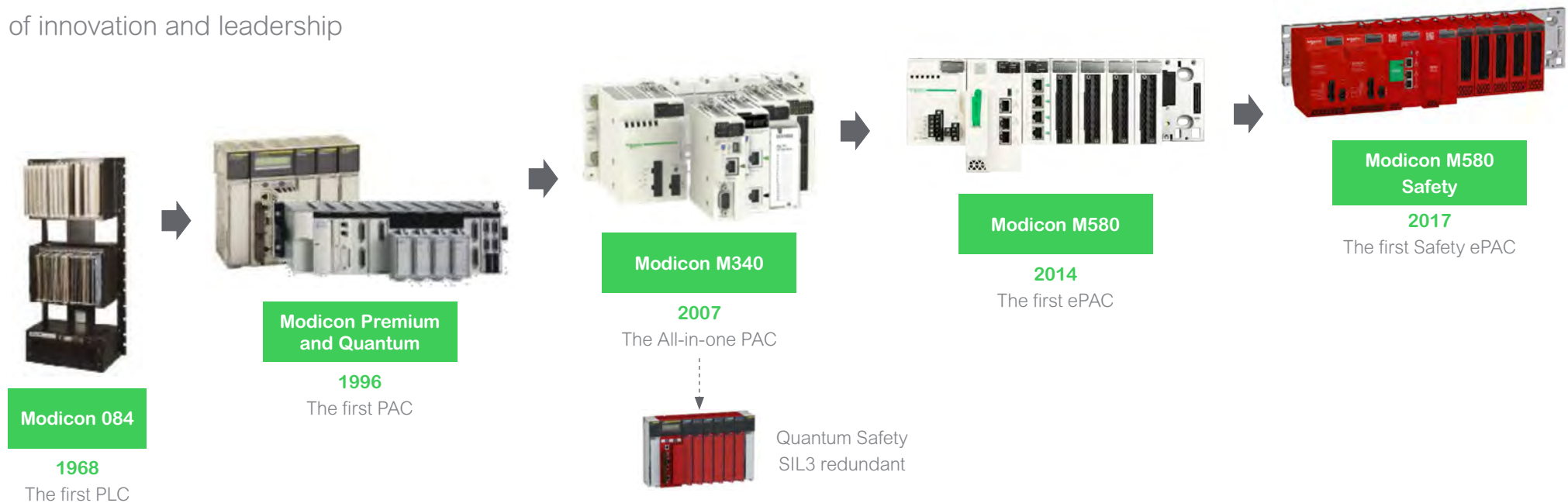
Modicon 084

1968
The first PLC

Modicon Premium and Quantum

1996
The first PAC

Modicon M340

2007
The All-in-one PAC

Quantum Safety
SIL3 redundant

Modicon M580

2014
The first ePAC

Modicon M580 Safety

2017
The first Safety ePAC

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What's new in the Modicon M580 Safety?

Behind the Modicon M580 Safety ePAC's unique capabilities are a number of new features

Integrated process control and safety together thanks to common safety

Complete integration of Ethernet architecture

From transparent to highly secured architecture – a common safety controller truly ready for the IIoT with built in advanced cyber security

Dynamic error code correction and high diagnostic capabilities for improved system reliability

Securely integrate plant safety functions thanks to dual redundant processor architecture

Continuous, open and transparent communication backbone

Default conformal coating protects from harsh environments that may contain moisture and or chemical contaminants

Common Safety
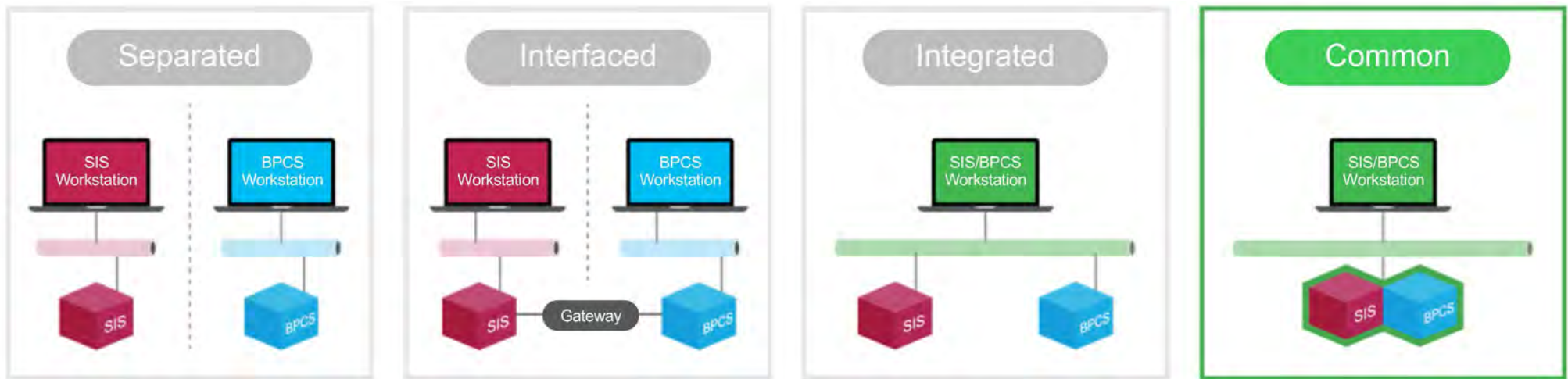
What is Common Safety?

- **Common Safety** is a technology which allows a closer integration of process and safety functions. It ensures that both process and safety operations are separate and independent with different hardware resources in a common engineering environment.

- Safety and non-safety modules are **integrated seamlessly** to provide a high level of flexibility, adaptability and easy-of-use.

- The **common engineering environment** provides independent and password protected tasks for the safety functions.

What is driving Common Safety in Hybrid Industries?

Today's industrial environment has an increased need for:

- Closer integration with automation systems

- Ease of use

- System architecture performance, flexibility & interoperability

- Reduced engineering time and cost needed to provide an effective safety system

- Shorter times to develop systems and be up-and-running

New technology now makes it feasible to integrate Process Control & Safety together, in a single, common safety controller

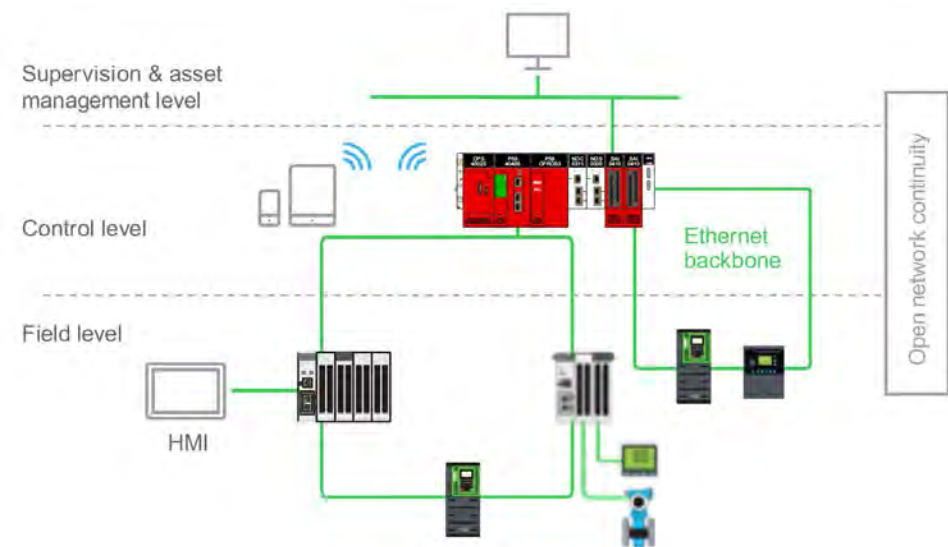A safety ePAC with all the high-end capabilities of the world's first ePAC

Native Ethernet capabilities

Thanks to the built-in Ethernet backbone in the Modicon M580 ePAC, the components in your plant control architecture are seamlessly interconnected to reap IIoT benefits.

Continuous communication flow

- Direct high-speed communication between control and devices for faster configuration and maintenance

- Direct high-speed deterministic communication between CPU and I/O modules for higher precision

Supervision & asset management level

Control level

Field level

HMI

Ethernet backbone

Open network continuity

- Top-to-bottom standard Ethernet network
- Open architecture with a direct Ethernet connection on backplane
- Ethernet remote I/O racks and drive on Ethernet service drop port

A pioneering controller

Common safety

High-end capabilities

Seamless integration

Segment applications

Native Ethernet capabilities

Integrated Ethernet infrastructure

• Wi-Fi communication, fiber-optic converter, router, and switch functions are embedded into the configuration

• Easy cabling with a third Ethernet port available on all Ethernet modules

Openness

• Open to third-party devices supporting Modbus TCP and Ethernet IP

• Standard FDT/DTM combined with Ethernet simplifies management of third-party devices

• Backplane open for easy design of Modicon X80 expert modules by CAPP partners (network socket communications, GPS support, weighing modules, and expert diagnostics)

High performance...

The Modicon M580 Safety ePAC delivers a remarkably high level of computing power for increasingly data-intensive processes.
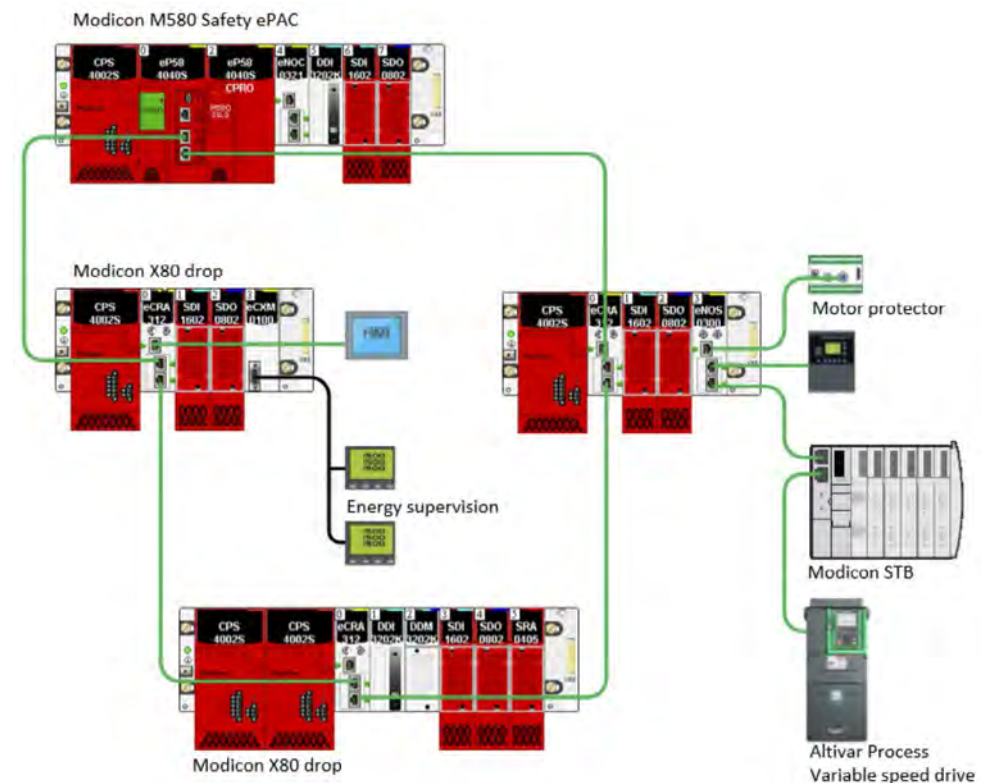
Key features

- Multi-core processor: parallel processing to optimize application execution

- No impact on scan time, even when processing large data flow, thanks to the unique Ethernet architecture

High performance

- End-to-end 100 Mbps speed, from top to bottom

- Application response time on safety up by 5 times*

- 16 MB memory*

*Compared with legacy ranges

Modicon M580 Safety ePAC

Modicon X80 drop

HMI

Energy supervision

Modicon X80 drop

Motor protector

Modicon STB

Altivar Process Variable speed drive

A pioneering controller

Common safety

High-end capabilities

Seamless integration

Segment applications

Enhanced cybersecurity

The Modicon M580 Safety ePAC's cybersecurity system has proved effective in rigorous testing with simulated cyberattacks. Firmware and software integrity is checked at every startup and during runtime, and encrypted in memory to prevent decompilation by a third party.

Successfully prevented cyberattacks by hackers during lab tests

Cybersecurity-ready

- IPsec communications protocol
- Cybersecurity certified (Achilles Level 2)
- Encrypted password access
- Strict supervision of firmware and software integrity
- Easy to configure via the Unity Pro platform
- Audit trail of login
- Hardened access control

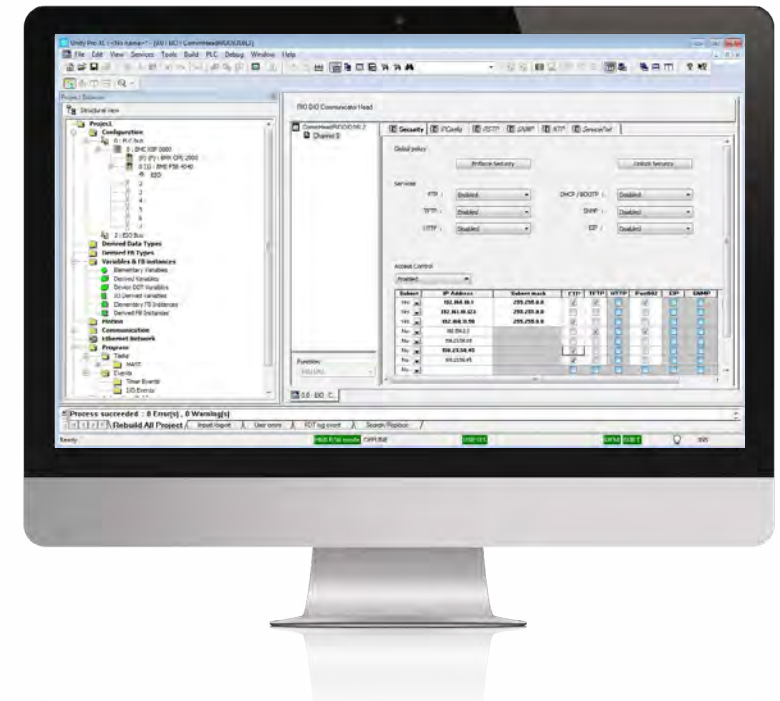A pioneering controller | Common safety | **High-end capabilities** | Seamless integration | Segment applications

Enhanced cybersecurity

Unity Pro cybersecurity configuration

- Easy to set the required security level

- Configuration does not require a cybersecurity expert; configurable by authorized plant personnel

- The device's default mode is secure

A pioneering controller

Common safety

High-end capabilities

Seamless integration

Segment applications

More flexibility in design

With the Modicon M580 Safety ePAC, you enjoy versatility in architecture design, allowing you to reduce development costs

Use Ethernet as an I/O network

- Flexibility in design thanks to a rich library of Tested, Validated, and Documented Architectures (TVDAs)

- Ring architecture provides additional network resilience

Mix core control devices on Ethernet

- Flexible topology allows simple integration of core control devices

- Ability to mix remote Safe and non-Safe I/O, distributed I/O, and other devices on the same Ethernet field network with easier software integration

- Transparent access to data through the Ethernet backbone

Easily connect to fieldbus and other networks

- Simple HMI operator panel integration via third port on the remote I/O head

- Interface to other popular fieldbus and device networks, including AS-Interface, Modbus, Profibus, HART, and CANopen

Simplified architecture reduces costs

- A common and unified hardware and software (reduced need for training/ spare parts/operation/maintenance/etc...)

- A highly flexible and scalable solution with the possibility to mix architectures to best suit your needs

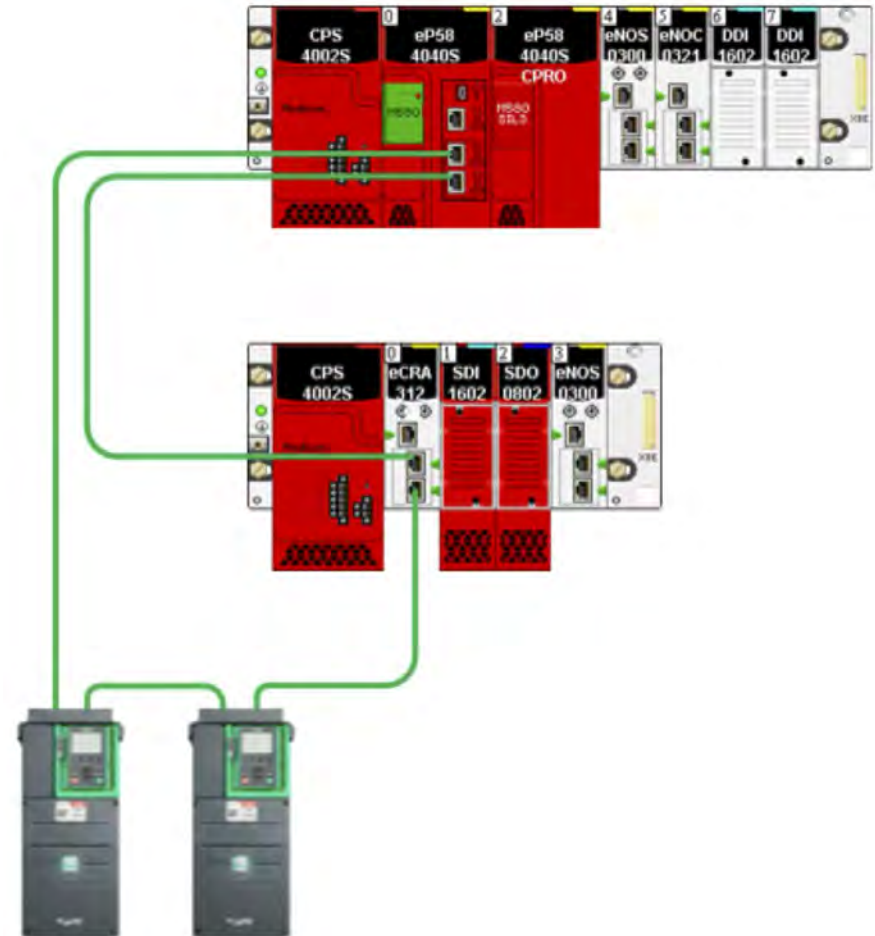 – Manage both Safety and Non-Safety applications

  – Separate Safety and Process Control

More flexibility in design

Drives directly integrated on the Ethernet remote I/O bus

- No additional cabling cost

- High availability with self-recovery loop

- Easy integration through FDT/DTM technology

- Ready-to-use function blocks in the Unity Pro platform for Altivar™ Process variable speed drives

- Easy replacement with drive configuration stored in the Modicon M580 Safety ePAC
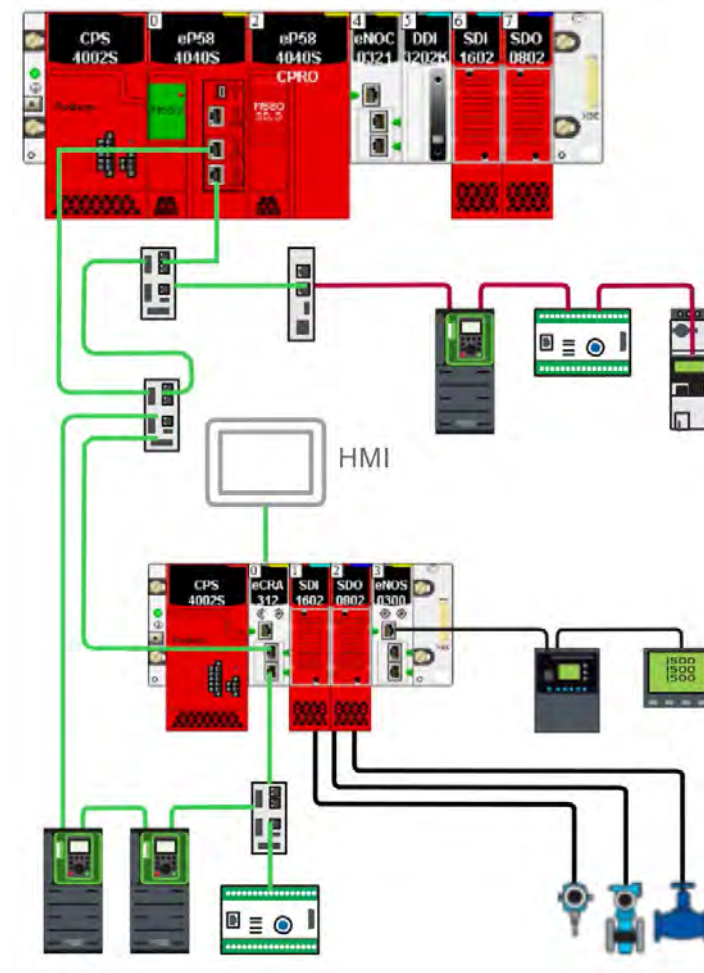
More flexibility in design

Fully integrated plant control architecture

Interconnect both your control equipment and safety equipment with flexibility:

- Ethernet remote I/O drops
- Drives on Ethernet RIO
- Distributed I/O
- Gateway for fieldbus on Ethernet RIO
- Devices on Ethernet services ports

A pioneering controller

Common safety

High-end capabilities

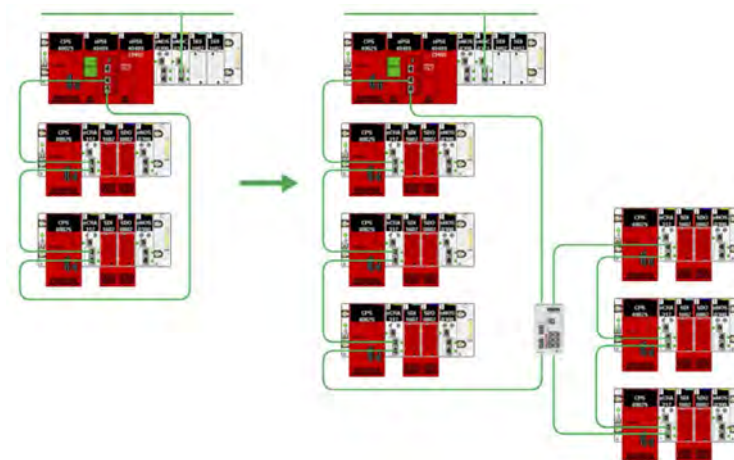Seamless integration

Segment applications

Greater agility for your operations

The Modicon M580 Safety ePAC supports the agile development methodology, where you can adapt your applications and architecture incrementally for immediate results. This not only reduces downtime but also ensures higher process quality.

Perform live updates while the process is running – with change configuration on the fly

- Add new RIO drops or new modules to the architecture

- Hot swap your modules – with automatic reconfiguration

- Modify application or change variables

Reduce downtime with a wide set of CCOTF features

Evolve and scale your architectures without stopping the process

A pioneering
controller

Common
safety

**High-end
capabilities**

Seamless
integration

Segment
applications

Seamless integration, from field to enterprise level

The Modicon M580 Safety ePAC, the high-end integrated common safety controller

EcoStruxure™ is our IoT-enabled, open, and interoperable system architecture that transparently connects the control, operation, and enterprise levels of your business.

The Modicon M580 Safety ePAC gives you the power to design, implement, and run processes that efficiently employ the benefits of open networking, helping you:

- Access consistent and accurate data for timely decisions

- Reduce downtime with detailed insight into alarms and events

- Rapidly diagnose and identify root causes of issues

- Make informed decisions about plant operations and energy management

The Modicon M580 Safety ePAC

A pioneering controller   Common safety   High-end capabilities   **Seamless integration**   Segment applications

Native integration with best-in-class SCADA supervision systems

The Modicon M580 Safety ePAC integrates seamlessly with best-in-class SCADA software, including Wonderware and the SCADA Expert Vijeo Citect.

This native integration allows operators to handle process disturbances efficiently and without delay, thanks to:

| Optimized configuration for high-speed communication and better response time | Online modification or configuration of the Modicon M580 Safety ePAC all within the SCADA system | Direct view of controller alarms within the SCADA interface | Visibility of all process data and field devices from the SCADA level | Native diagnostic of the entire control system embedded in SCADA |

A pioneering controller   Common safety   High-end capabilities   **Seamless integration**   Segment applications

Native integration with best-in-class SCADA supervision systems

Wonderware System Platform

Key features

- Seamless integration with the Modicon M580 ePAC thanks to Open Platform Communications (OPC)

- Ready-to-use, out-of-the-box function blocks and faceplates

- Situational awareness functionality

SCADA Expert Vijeo Citect platform

Key features:

- Seamless integration with the Modicon M580 Safety ePAC thanks to Open Platform Communications (OPC)

Wonderware System Platform and SCADA Expert Vijeo Citect platform provide faster time-to-market and enhanced operational efficiency, thanks to:

- Reduced risk

- Improved process uptime

- Reduced loss of production

Greater energy efficiency with Altivar Process drives

The combination of the Modicon M580 Safety ePAC and Schneider Electric's Altivar Process variable speed drives results in a truly productive, efficient, and energy-aware process.

- Altivar Process provides dual Ethernet daisy-chain ports and high availability

- DTM integrated for the Unity Pro FDT container, allowing easy access to your equipment's data without developing a special user interface

- Dedicated object libraries, embedded commissioning tools, and predictive/preventive diagnostics simplify the configuration and maintenance of automation assets

- The embedded energy measurement functions in Altivar Process allow you to easily monitor the energy performance of your more demanding assets (motors, pumps, fans), helping optimize the overall energy efficiency of your process

- Altivar Process variable speed drives

A best-in-class controller
for your applications

Comprehensive solutions and support for system integrators

As the global specialist in energy management and automation, Schneider Electric offers comprehensive solutions and support to meet system integrators' requirements across numerous market segments.

From design through to implementation, Schneider Electric technology helps system integrators reduce time-to-market thanks to:

- A single automation platform for multiple applications

- Tested, Validated, and Documented Architectures (TVDAs)

- PSX builder tools, object-oriented programming, and libraries

- Simplified spare-part management

Join our System Integrator
Alliance Partners program, today!

Wastewater treatment

- Control safety functions for processes which create biogas from sludge

- Simplify control architecture with common safety controllers for gas protection and fire systems

- Comply with advanced cybersecurity standards to protect critical infrastructure applications

- Increase operational reliability in harsh environments thanks to hardened systems

- Improve remote control with integrated RTU communications based on telemetry protocols

- Improve operational profitability and maintenance efficiency with advanced pump control and diagnostics through integration with Altivar Process variable speed drives

- Simplify management of smart devices and instruments with Ethernet and fieldbus connectivity
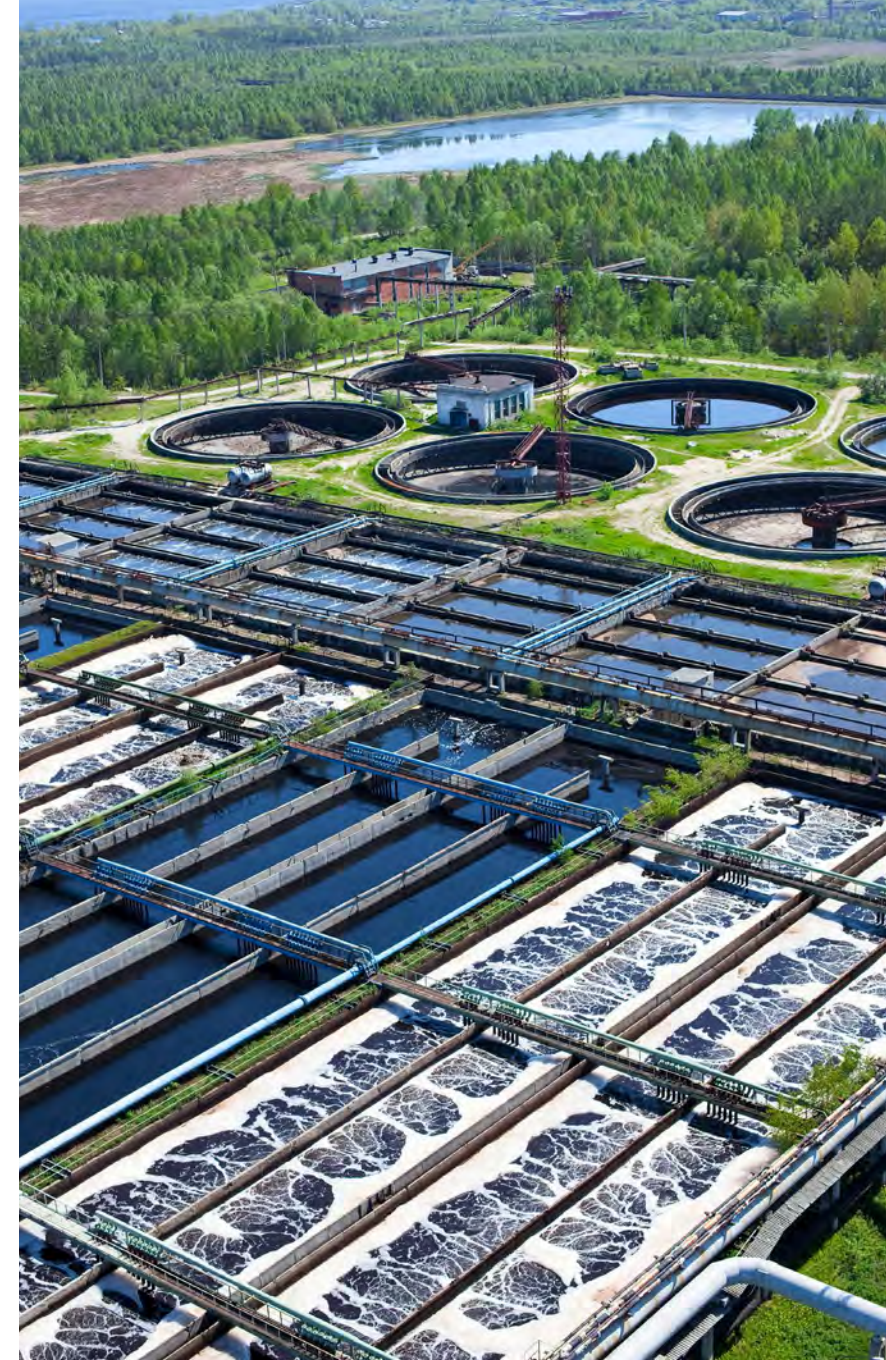
Food & Beverage

- M580 Safety certified to control safety related functions in food and beverage plants such as burner temperature control, gas detection in explosive atmospheres and machine safety (e.g. material handling etc).

- Features such as integrated Ethernet backbone, AS-I Master modules, and weighing solutions help you simplify your control architecture and improve profitability.

- Install ATEX-compliant products where applicable for explosive environments

- Processing power and 64 MB of memory help you standardize hardware across diverse plant processes.

- Improve performance reliability with remote I/O synchronization

- Easy integration with FDT/DTM technology

- Changes can be made without shutting down key processes which reduces downtime

- Native 4 GB SD card lets you store your recipes locally in the controller

- Built in high bandwidth Ethernet gives you the visibility to understand and optimize your processes

- Ability to connect HMI to native service ports enhances local plant floor control for increased safety and productivity

Mining & Metals

- Control systems for safety application in mining and metals including:

  – Crane and Hoist control (weight load, speed and transmission of mine hoists or overhead cranes) to protect both machinery and operators

  – Machine safety (e.g. for material handling applications)

  – Control safety functions for burners, boilers or compressors

  – Control gas detection, fire systems and dust explosion risks

- Change configuration on the fly to reduce the downtime associated with maintenance activities.

- Redundant power supplies coupled with ring topology for high availability in critical applications

- Faster scan time and the largest CPU memory available so you can achieve higher performance and productivity

- Flexible Ethernet-based automation architectures to make it easier to develop new systems and upgrade existing ones

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For more information
about the Modicon M580 ePAC, visit

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